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By

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Dedication

To Mom and Dad, your belief in me never faltered. Thank you for inspiring me to reach for the stars. And to Joe, for never ceasing to amaze me.

Abstract

The implementation of learning styles in the classroom is not a new method in teaching. However, this study aimed at the implementation of learning styles by students instead of teachers. Using an exploratory design approach, learning styles data was collected on a small sample of students attending a regional university in the upper Midwest. Subjects completed a 3 or 6 week learning styles workshop focused on implementation of their individual learning styles. Student's semester and cumulative GPAs were tracked to assess whether implementation of a learning styles system in higher education would be effective in increasing academic success. Results showed that, on average, subject's semester and cumulative GPA's did increase. The implications of these results suggest that further research needs to be completed for additional evidence of the power of student initiated learning styles in the higher education system.

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Chapter One

Introduction

President Obama stated, “The best education is one where kids learn how to learn, and they learn how to think for themselves” (Straus, 2012, final para). Learning how to learn is the foundation of an education supported by an individual’s learning style. The positive correlation between implementation of learning styles in education and academic success is proof that ‘the best education’ that President Obama refers to, is alive and well with the practice of learning through learning styles.

While the positive correlation listed above has been studied in K-12 classrooms, research surrounding application of learning styles based education in a higher education setting has been sparse. Specifically, there has been a lack of research on student initiated learning style implementation. The study being examined focused on 50 University students who used learning styles to increase their academic success within their courses. Professors were not informed of the learning style techniques, and were not asked to change their methods of delivery. The study focused on student responsibility for implementation of styles and interpretation of information.

Purpose of the Study

The purpose of this study was to examine the effect of implementation of learning styles and academic success in a higher education setting. It was hypothesized that as individual learning styles were implemented by students, their academic success would increase. Academic success is characterized in various ways, which are addressed in the definitions section of this chapter.

Background

According to Cassidy, a Senior Lecturer in Psychology, learning styles can be defined as, “the manner in which individuals choose to or are inclined to approach a learning situation” (Cassidy, 2010, p 420). The research surrounding learning styles and their application in an educational setting has been active for more than four decades (Cassidy, 2010). However, a majority of the research has been done on young students in a K-12 educational setting. The following provides a background of learning styles in order to stress the importance of implementation in a higher education environment.

Based on their research, Samms and Friedel, both professors of education, found that rehearsal (memorization) was the primary study strategy used for students (Samms & Friedel, 2012). However, rehearsal in and of itself does not lend itself to the concept of critical thinking. According to Crenshaw, a history instructor,

> “A pedagogy that does not emphasize a clear and explicit understanding of critical thinking results in didactic instruction; that is, a ‘mother robin’ approach characterized by instructors disseminating large amounts of information that will soon be forgotten. In contrast, when students are taught to think through information, they obtain what dedicated instructors aspire to impart to their students: knowledge” (Crenshaw, P., 2010, p.1).

With the integration of a learning styles education approach, even in these rehearsal based learning environments, students are able to incorporate critical thinking and therefore, take away the knowledge that their instructors are imparting on them. An education with an emphasis on learning styles focuses on an individual’s ability to make meaning of information and create knowledge based on that information. They are not reacting to an external force and answering a

question based on recall (Colucciello, 1999). By incorporating learning styles, students are practicing critical thinking which promotes a deeper understanding of material and thus, higher instances of academic success.

There has been research on whether or not presentation of material *according to* learning styles is effective in increasing academic success (Dunn, 1990, Verster, 2010, Ford & Chen, 2002). What remains to be explored, however, is the effect on academic success when University students take on the responsibility of implementing learning styles themselves. The concept surrounding implementation of learning styles focuses on the development and use of an individual's specific style. After identifying the individual learning styles, the subject implements style specific strategies in their daily academic career. Using these strategies, the individual is able to absorb information, regardless of whether the material is presented according to their individual style.

As expressed, research of learning styles has primarily focused on K-12 education. This study focuses on higher education. In a higher education environment, it is not only unlikely, but not feasible to expect a professor to present material a multitude of ways to accommodate varying learning styles (Weller, 2004, Pardakhtchi & Saidee, 2012). When given the appropriate methods, can a University student see an increase in academic success by implementing learning styles on their own versus individualized presentation of material by an instructor?

Setting

This research took place at a regional mid-western University.

Participants

A group of 50 students participated in a University sponsored program to learn more about and utilize their individual learning styles. Students ranged from freshman - graduate students with a variety of ages, majors, ethnicities and GPA ranges.

Assumptions

The study focused on student initiated education, meaning that the instructor was not responsible for providing activities associated with various learning styles. Due to average class sizes at the institution in which this research occurred, it was anticipated that the instructor would be unable to provide this type of instruction. In addition, instructors for different classes deliver their material differently and, therefore, it was assumed that students would benefit more by taking advantage of their own learning style by implementing tools specific to them vs. attempting to mold to a different style for each class.

Limitations

The research was focused on a program offered through a Midwestern regional University. Students were referred to the program via professors, advisors, various members of the University community and through an e-mail recruitment letter. The results of this study are not generalizable to other groups or institutions due to the small sample size and the unique approach utilized by the *You are Smarter than You Think* program. In addition, data was only collected for two semesters due to funding issues. Lastly, because of the type of research conducted, a control group was not available, and thus the research is considered a multiple case study method.

Definitions

- Academic Success: for the purpose of this study, academic success was determined based on three measurements. The first measurement is the student's GPA over the course of multiple semesters. The second measurement is based on student testimony. The final measurement was retention of student participants.
- Learning styles: an individual's unique approach to learning based on strengths, weaknesses, and preferences.
- Learning Styles Education approach: An education approach focused on students' unique learning styles and implementation of the styles in and out of the classroom to facilitate a deeper understanding of material.
- Rehearsal based learning environments: A learning environment centered on memorization and rehearsal of information. A typical approach when studying for exams.
- Self- Efficacy: An individual's belief in their ability to complete a goal
    - In terms of academic self-efficacy, an individual's belief in their ability to succeed academically.
- Student specific learning approach: An individualized learning approach.
- Style matching: An instructor teaches using strategies specific to a particular learning style, thus matching the student(s) learning style.
- Critical thinking: "Critical thinking is the intellectually disciplined process of actively and skillfully conceptualizing, applying, analyzing, synthesizing, and/or evaluating information gathered from, or generated by, observation, experience, reflection, reasoning, or communication, as a guide to belief and action" (The critical thinking community).

Summary

In conclusion, learning styles continue to be utilized in various settings and ways in education. However, the best method for implementing learning styles in a classroom continues to be debated. This project will help to determine whether a University student can increase their academic success by implementing an individualized learning styles approach vs. a style matching approach.

Chapter Two

Literature Review

In the development of a research design associated with learning styles, a review of the literature was completed. Learning styles refer to the concept that we each process information in different ways (Shannon, 2008). The focus of this literature review is to discuss learning styles and their development, the process in which learning styles are implemented, and the results of a learning styles based education.

Learning styles – a review

The use of the term "learning style" is used broadly throughout education and research. The general premise of learning styles is that learning is specific to the learner/subject. Therefore, for the purpose of this research, we will categorize it as a student specific learning approach. Educators have been focusing on student specific learning approaches for decades. Consider Carl Jung's focus on psychological types in terms of education and learning styles (Stevens, 2001). In addition, in 1978, Dunn and Dunn's research was comprised of 18 elements that made up learning styles that were designed according to four basic stimuli (Kazu, 2009).

"Both theories (learning styles and multiple intelligences) claim that dominant ideologies of intelligence inhibit our understanding of human differences" (Silver, Strong & Perini, 1997, para 2). Based on this understanding, for the purpose of this research, multiple intelligences will be synonymous with learning styles. Howard Gardner chose to focus on multiple intelligences in terms of learning styles specific to the learner. He believed that there are 8 different intelligences that each individual possesses. The extent to which an individual excels in various aspects of academia and subjects is based on the amount of intelligence they possess in the various intellectual areas (Campbell & Campbell, 1992). The intelligences Gardner refers to are

Verbal/Linguistic, Mathematical/Logical, Visual/Spatial, Musical, Bodily Kinesthetic, Intrapersonal, Interpersonal and Naturalistic.

Verbal/Linguistic Intelligence: A linguistic learner is characterized by an ability to manipulate words and a passion for doing so. This intelligence includes a capacity to learn language and use language to accomplish certain goals. Linguistic learners use language and words to help remember information. Careers for individuals with high linguistic intelligences include writers, poets, lawyers and speakers (Campbell & Campbell. 1992).

Mathematical/Logical Intelligence: A logical learner is characterized by being a rational person. They are typically good at finding patterns, establishing cause-and-effect relationships and conducting experiments. They enjoy information that is organized effectively. They have the capacity to analyze problems logically. Typically someone who has a high logical intelligence will be most comfortable associated with mathematics and science (Campbell & Campbell. 1992).

Visual/Spatial Intelligence: A Spatial learner is characterized by needing a visual representation of information and having a keen sense of patterns. This does NOT mean that a spatial learner is always a visual language processor. It simply means that they understand information more effectively when it is presented in a visual form (other than text). They are typically going to respond best to diagrams and charts when trying to understand information. Visual aides are important for them to understand the underlying message. People who are 'spatially intelligent' are very perceptive of even slight visual details. They can typically sketch out ideas with graphs, tables and/or images (Campbell & Campbell. 1992).

Musical Intelligence: A Musical learner has the ability to listen and decipher between different sounds. They may have the ability to play an instrument or sing. They may develop a personal

frame of reference for listening to music. A musical learner enjoys listening to music and a variety of sounds, including the human voice and environmental sounds. They enjoy learning through music and prefer to incorporate it into their learning. They respond to music kinesthetically, emotionally, aesthetically and/ or intellectually (Campbell & Campbell. 1992).

Bodily Kinesthetic Intelligence: A Bodily Kinesthetic learner enjoys exploring the environment and objects through touch and movement. They typically prefer to touch, handle or manipulate what is to be learned. They have highly developed sense of timing and coordination. They learn best by direct involvement and participation. They remember most clearly what was done, rather than what was said or observed. Bodily Kinesthetic learners enjoy concrete learning experiences that include field trips, games and physical exercise. Typically they show dexterity in working by means of small or gross motor movements and are sensitive and responsive to physical environments and physical systems (Campbell & Campbell. 1992).

lntrapersonal Intelligence: An lntrapersonal learner is in touch with his/her own feelings. They are motivated to identify and pursue goals and have a distinct ability of creating plans to do so. They enjoy working independently and are curious about the "big questions" in life. An Intra personal learner strives for self-actualization and enjoys empowering others. They are categorized as very experiential in their learning. They are very good at finding approaches and outlets to express their feelings and thoughts and enjoy doing so through their learning (Campbell & Campbell. 1992).

Interpersonal Intelligence: An Interpersonal learner has the ability to form and maintain social relationships easily. They find it easy to relate to others and perceive feelings, thoughts, motivations, behaviors and lifestyles of others easy to recognize. They enjoy working in groups of people and participating in collaborative efforts. They have the ability to influence the

opinions or actions of others. They adapt behavior to different environments, groups and on the feedback from others. Interpersonal learners learn best when they have the opportunity to interact with their peers (Campbell & Campbell. 1992).

Naturalistic Intelligence: The Naturalistic intelligence is the last of the 8 intelligences and the least recognized. A Naturalistic learner has a keen sense of his/her environment. They are inclined to be outdoors and in nature (Campbell & Campbell. 1992).

Gardner's work throughout his career lead to an increase in research surrounding the effectiveness of implementation of learning styles and the reasons different learning styles exist. According to Dunn, Beaudry and Klavas, it begins in the brain; there is a connection between learning styles and the hemiphericity of the brain (Dunn, Beaudry & Klavas, 2002). For example, one study extrapolated that, "right-hemisphere community college adult math underachievers preferred learning with sound and intake. They wanted tactile and kinesthetic instructional resources and mobility significantly more often than their left-hemisphere counterparts" (Cauley, Linder & McMillan, 1991 p 135). These findings suggest that a relationship exists between the biological make up of a student's brain and their ability to process information effectively. When material is processed in a mode conducive to the individual's specific learning style, critical thinking is more likely to occur, and thus, the material is more likely to be retained.

With evidence suggesting that learning styles are physiological, the question still remains of how to apply them. According to Fara Green (1999), the Director of Gifted and Talented Programs for the El Paso Independent School District, "brain and learning research indicates that the brain responds more to learning environments that are enriched and that involve as many of its processing centers as possible" (p.686). Is there one way of implementation that lends itself to a more enriching environment? Is there an approach more

conducive to student success? In order to make this determination, a review of the various settings is essential.

Implementation of Learning Styles

In some environments, the teacher is responsible for developing a tailored instructional approach within their classroom. For example, Ibrahim Kazu, a faculty of technical education, believes that teachers should match their teaching style to each of their student's unique learning style. Therefore, tasks throughout a lesson should be tailored for each student. (Kazu, 2009). Romanelli, Bird, Ryan, et al. (2009) believed that the classroom should be set up to promote multiple learning styles in one lesson. Another implementation of learning styles is the more recent development of technology in and outside of the classroom. In a study by Clayton, Blumberg and Auld (2010), one hundred and thirty two students were given surveys regarding their preferred educational environment. Based on how the student learned best, they would choose a less or more traditional classroom environment. A current example of this is the WiloStar 3D school. The WiloStar3D Virtual World for Education is a distance learning service that provides students with a school environment in a home-school setting. Students navigate through a virtual world with an avatar chosen to portray them and attend live classes via 3D classrooms. Those students who have chosen to attend the WiloStar 3D virtual school would have most likely chosen a less traditional classroom for their desired learning environment if available.

The Clayton, Blumberg and Auld (2010) study introduced the idea of choice within an educational environment. This idea becomes a key component to effectively carrying out learning styles in a higher education setting, and therefore, this research. In this setting, the student is no longer simply presented material by means of their learning style. Why is this

important? According to a study done by Samms and Friedel (2012), in an undergraduate setting, there is typically a 20 point cognitive style gap in learning strategies between the instructor and the student. This 20 point gap requires the student to rely on their own strengths instead of being presented material that already fits their strengths. The student is responsible for his or her own learning. “In this way, the individual can acquire the constantly changing and increasing amount of information without need for the assistance of others” (Kazu, 2009, pg. 8). According to Kazu (2009), this also lessens the burden for teachers, as they are no longer responsible for the distribution of information in a multitude of ways and environments. This shift of responsibility allows learning styles to play a large part in higher education and student success.

Research suggests that there is no right or wrong way to implement learning styles in education. In fact, Anthony Grasha, a learning styles typology developer, believes that simply acknowledging that there is a difference in learning/teaching styles can assist a student. “Acknowledgement can be empowering for students if they can be made aware of their preferred learning style(s) and assisted in stretching their capabilities to accommodate greater variety” (Montgomery, S.M. & Groat, L.N., 1998.p 5). By empowering the student, student learning is enhanced and academic success increased (Montgomery, S.M. & Groat L.N., 1998). However, in a higher education system it simply is not plausible to expect professors to apply a system like Romanelli et al suggests. A model comparable to Freidel and Samms would be more appropriate in this case. By putting the responsibility of active learning in the student’s hand, we are giving them the opportunity to *learn how to learn*, and thus, giving them the opportunity to succeed.

Learning Styles and Academic Success

In measuring academic success, the research focuses on a variety of factors. The first qualification of academic success is ability to employ critical thinking skills. According to Paul

and Elder (2007) critical thinking can be defined as, “the art of analyzing and evaluating thinking with a view to improving it… it is self-directed, self-disciplined, self-monitored, and self-corrective thinking ” (pg. 4). As stated, Samms and Friedel (2012) found that rehearsal was the primary study strategy used for students. However, rehearsal in and of itself does not lead to critical thinking. Rehearsal can be considered surface level knowledge. With the incorporation of learning styles in these rehearsal based learning environments; students are able to incorporate critical thinking. “Because learning styles refer to individuals’ modes of making meaning of and dealing with knowledge and not merely reacting to external forces, they influence one’s behavioral dispositions, personality, interests and choices” (Colucciello, 1999, pg. 295). By incorporating learning styles, students are practicing critical thinking which promotes a deeper understanding of material.

The incorporation of learning styles, and in turn critical thinking, lends itself to the the second factor of academic success: self-efficacy (Coutinho and Neuman, 2007). Academic self-efficacy can be defined as a student’s confidence in their ability to perform various academic related tasks to a pre-determined outcome, such as a specific letter grade. According to Vuong, Brown-Welty and Tracz (2010), “self-efficacy is the single strongest predictor of GPA when examining academic success models, even taking into account high school academic performance and demographic variables” (p. 52). The importance of a strong sense of academic self-efficacy has been proven effective in increasing and maintaining GPA as well as promoting persistence within school (Zajacova, Lynch & Espenshade, 2005).

Student academic success happens when the student puts it all together. Felder and Solomon (1994) believe that students need to be active participants in their learning. They need to learn how to they learn best and apply that knowledge to become active or self-directed

learners. Implementing learning styles allows the student to begin emphasizing the importance of higher order thinking tasks such as analysis, synthesis and evaluation in their everyday academic life. These processes are the basis for critical thinking. Incidentally, as the student utilizes their learning styles to understand material on a deeper level, they perform better and become more engaged in their school work. The increase in performance increases self-efficacy. "The beliefs that students develop about their academic capabilities help determine what they do with the knowledge and skills they possess. Consequently, their academic performances are in large part the result of what students actually come to believe that they have accomplished and can accomplish" (Klomegah, 2007, pg. 2).

Fundamentally, incorporating learning styles promotes positive academic habits and a positive academic experience. In a study done by Linda Mayfield (2012), a group of first year nursing students implemented their individual learning styles into their study regimen. Results indicated that not only did the nurses improve academically but they also continued to use their learning styles throughout their academic career based on the success they had experienced. “Students who had been taught to identify and apply learning styles information believed they retained the knowledge and intentionally applied it at a high level throughout their college experience, demonstrating a high level of self-efficacy” (p. 7). This example of nursing students provides evidence for the relationship between learning styles, critical thinking and self-efficacy, all of which promote academic success.

“Honor your strengths and they will honor you” (Mollan-Masters, 2009, p 49). Allowing a student to use their strengths to succeed is the foundation of the theory behind a learning styles education. The flexibility of application within and outside of the classroom allow

for all students to benefit. As students gain confidence in their critical thinking abilities using their learning styles, they become better, more effective learners.

While the results of learning styles implementation in the classroom has been addressed, most of the research surrounding learning styles has been performed on a K-12 environment. The research forthcoming focuses on the application of a learning styles education model in a University/ higher education environment.

Chapter Three

Methodology

The purpose of this study was to evaluate the effectiveness of implementing a learning styles based education in a University/Higher Education setting. Up until now, little research has been conducted on student led implementation of learning styles in education, and thus, this study focuses on the results of that application. This chapter focuses on the Setting for which this research was conducted as well as the participants that were studied. In addition, chapter 3 describes the research design, methodology, data collection and the completed data analysis.

Setting

The setting for this project was at a regional university in the upper Midwest. The university enrolls approximately 11,000 students in undergraduate and graduate programs distributed in 5 colleges. The majority of the student population is white with approximately 9.8% of students self-reporting that they are a minority; the student population is represented equally by males and females.

Participants

The participants included in this study were enrolled at the university during the semester they participated in the study. The 50 subject's ages ranged from 18- 30 years with approximately 20% male participation and 80% female participants. Students were referred to the program by professors and advisors at the institution as well as recruited via e-mail announcements. Subject's majors were not recorded as this could be potential identifying information. Undergraduate students with a cumulative GPA below a 2.0 in one college were required to participate (in the fall of 2011) as part of their probationary requirements. The participants did not participate anonymously; however, their identities were removed and

replaced with their student ID number on an encrypted computer. Only the Principal Investigator had access to participant records. Formal written consent was waived per the Institutional Review Board's request.

Research Design

This research was primarily an exploratory design. Due to the lack of formal research surrounding student initiated implementation, this research focused on determining whether additional research in the future would be beneficial. In addition, the exploratory design was implemented to gain insight as to what aspects of a learning styles education needs to be made a priority in future research.

Procedures

After submitting and receiving approval from the Institutional Review Board, e-mail recruitment to potential students began. For those potential students who responded to the e-mail recruitment, meetings were arranged to discuss the program/research and obtain verbal consent. Once verbal consent was obtained, students were asked to sign up for a 3 week program or a 6 week program. The program consisted of the same reading and on-line reflections, however, students were expected to complete the material within 3 weeks vs. 6 weeks depending on their program choices. Students met with the researcher either weekly (for the 3 week program) or bi-weekly (for the 6 week program). The meetings ranged anywhere between 20 minutes to an hour depending on the chapter content, subject questions and discussions. Meetings were one-on-one and confidential.

The results of the *You are Smarter Than You Think* assessment (Mollan-Masters, 2009) were organized into three areas of learning: reception, reorganization and retention. The

reception part of the program focused on how the subject *received* information best. Reception was broken into three possible categories: auditory, visual and combination language processor. Scores on the assessments provided information about which receptive technique would be the most appropriate for the subject. The reorganization portion of the program was focused on the subject's ability to reorganize information regardless of its presentation. Reorganization centered primarily on note taking in and out of class. Within this category, we see three possible types: linguistic, logical or spatial (please refer to definitions for more information). As with the reception portion of the assessment, the scores indicated the most appropriate category for the subject. Lastly, the retention category focused on recall. The retention categories are: bodily kinesthetic, musical, interpersonal and intrapersonal. Based on the subject's scores, various recall techniques were provided. For more information, the researcher provided additional tools centered on the subject's scores on the Learning Styles Inventory for Adults. Once learning styles were established, meetings were created to assist in the development/practice of tools designated to assist the subject based on their learning style(s).

At each meeting, the subject and researcher would discuss a different style/intelligence based on the subject's scores from the initial assessments. Within this discussion, various study techniques were discussed and practiced. As stated previously, the results from the *You are Smarter Than You Think assessment* (Mollan-Masters, 2009) were broken down into three categories. The categories included reception techniques, reorganization techniques and retention techniques.

In the first meeting, the concentration was on reception. Techniques, based on the student's results from the *You are Smarter Than You Think assessment* (Mollan-Masters, 2009) were discussed. Strategies, as detailed in the *You are Smarter Than You Think* book (2009), are

provided based on the auditory preference of each student. The second meeting focuses on reorganization strategies for the student. Based on the results of the *You are Smarter Than You Think assessment* as well as the Learning Styles Inventory for adults, strategies are provided for reorganizing information. This section is stressed as it requires the most change from their normal practices for most students. The researcher would ask the student to bring in a textbook of their choice to practice the learning styles strategies specific to the student. The final meeting focused on retention. Based on their results from the assessment, retention strategies were discussed. All of the meetings were one-on-one and focused on answering questions related to strategy and implementation of strategies. After the three initial meetings, subjects were released and data collection began.

Data Gathering and Analysis

Three types of data gathering and analysis were performed to determine the effectiveness increasing academic success via a student initiated learning styles program. Data collection consisted of collection pre and post cumulative GPA, retention rates of participates and student narratives.

A. GPA Tracking

Prior to consenting to participating, students were made aware that their GPA would be tracked. The average data of all students is based on students who participated in the fall 2011 cohort. GPA was tracked and calculated in terms of Semester Difference and Cumulative Difference. For the fall 2011 cohort, we looked at their fall 2011 Semester GPA as well as their Cumulative GPA (as of January 2012). We compared these GPA's to their spring 2012 Semester GPA as well as their Cumulative GPA (as of May 21, 2012). The semester GPA's were then compared to make up the Semester Difference, which created either a negative number (if their

spring 2012 semester GPA was lower than their fall 2011 semester GPA) or a positive number (if their spring 2012 semester GPA was higher than their fall 2011 semester GPA). This number was recorded for each student. We followed the same process to find the Cumulative Difference between the two semesters. We chose to focus on the semester difference to analyze trends of increased/decreased success by semester. A breakdown of the GPA data collection and analysis is available in Table 1.

Table 1

GPA calculations

Student fall 2011 cumulative GPA	Student spring 2012 cumulative GPA	Cumulative GPA Difference
2.5	3.0	+.5
2.5	2.25	-.25
	Average:	+.125
Student fall 2011 semester GPA	Student spring 2012 semester GPA	Semester GPA Difference
2.5	2.0	-.5
2.5	3.0	+.5
	Average:	0

After collecting the above data, we broke the information down into a series of groups. The first group contained freshman (fall 2011). We calculated both their semester and cumulative difference (procedure listed above). We used data from both the fall and spring cohort for this group because both the fall and spring cohorts were based on the same fall 2011 GPA. The remaining groups were made up of the students who had a cumulative GPA below a 2.5 as of January 2012, students who had a cumulative GPA above a 2.5 as of January 2012, and lastly, probationary students who had a cumulative GPA below a 2.0.

B. Student Testimony

The end of the semester survey was administered to all students who had participated in the program. The questions were meant to provide us with insight on what they had benefitted from, and what they had not. It was also used to gain information regarding the common learning types. The surveys are made up of multiple choice, short answer, true false and essay questions.

C. Retention

We chose to track retention rates of students who participated in the program. We looked at students from both the fall 2011 and spring 2012 cohort for these numbers. If the student was enrolled for classes for the upcoming fall 2012 semester, they were listed as retained. For those students who were not registered, we created a system to track why they were not returning. The system consisted of dismissals, graduates, transfers and 'other'.

Instruments

On the initial meeting, subjects completed two assessments. The first assessment was taken from the book, *You are Smarter Than you Think* (Mollan-Masters, 2009). The assessment focuses on Gardner's multiple intelligences (listed above). Using a 48 question assessment, referred to as the *You are Smarter Than You Think assessment* (Mollan-Masters, 2009) the subject was asked to identify various traits from when they were a child as well as preferences evident now, in their adult life. The subjects then completed a Learning Styles Inventory for Adults (Silver, Strong & Perini, 2000). This inventory was based on Carl Jung's psychological types and included as a method for providing additional styles information.

The End of the Semester survey was developed using Google Forms, and is student specific (in that they answer the questions based upon the type of learner they are. The form was a smart form and presented questions based on answers from previous questions).

Summary

The purpose of this research was to determine whether student implementation of learning styles would be beneficial in increasing academic success in a higher education setting. Results are to be reported and discussed in chapter 4.

Chapter Four

Results and Discussion

In an effort to analyze the effect of student implementation of learning styles in a higher education setting, GPA trends, retention trends and student testimony was collected. The results as well as a discussion of the findings are included in this chapter.

Results

GPA Tracking

Table 2

GPA trends for student participants

Population	Semester GPA Increase	Cumulative GPA Increase
Fall 2011 Cohort	0.086	0.043
Freshman (Fall 2011 and Spring 2012)	0.2354	0.1498
Cumulative GPA below 2.5	0.1506	0.1358
Cumulative GPA above 2.5	0.07	0.024
Probationary students	0.8182	0.2263

As an average, student's semester GPA's were increased by .086 per semester and their cumulative GPA's by .043. However, 73% of students who participated in the fall 2011 cohort had a cumulative GPA increase on average of .113 a semester[1]. On average, the freshmen had semester GPA increases of .2354 and cumulative GPA increases of .1498. For those students who had a cumulative GPA below a 2.5, they raised, on average, their semester GPA's by .1506 and their cumulative GPA's by .1358. Students who had a cumulative GPA above a 2.5 raised their semester GPA's by .07 and their cumulative GPA's by .024. Lastly, on average, those students who were on academic probation raised their semester GPA's by .8182 and their cumulative GPA's by .2263.

`- The 73% accounts for the number of students who saw a cumulative GPA increase within the fall semester.

Subject Testimony

Table 3

Subject Testimony results

Testimony Statement	Percentage of student responses
This program was beneficial	89%
I really benefited from the program	46%
The program helped me somewhat	43%
I'm not sure if I benefited from the program	7%

The semester surveys that were provided to all of the subjects were meant to grasp the subject's success with the program and provide a qualitative measurement of success. Subjects were able to select more than once answer. The results of the survey are as follows: In total, 89% of the students who participated in the program found it beneficial. Of the subjects, 46% said that they "really benefited from the program" while 43% stated that the "workshop' helped them somewhat. Only 7% of the students stated that they were not sure if they had benefited from the workshop yet. The remaining 4% accounted for one student.

Retention

Table 4

Retention of subjects

Reason for lack of retention	Number of students
Dismissals	3
Graduates	2
Transfers	2
Student Conduct Violation	1
Other	0
Total	8

A 95% retention rate was found for the subjects who participated in the program.

Discussion

The original research design called for GPA tracking for a total of 4 semesters (two years). However, data collection was discontinued in the summer of 2012 due to funding cuts.

GPA Tracking

The average GPA Information for entire fall 2011 cohort consisted of semester increases of .086 and cumulative increases of .043. While these increases may appear to be small, when placed in context, it is clear that this amount is substantial. Take for example an individual enrolled at the University who is a pre Communication Sciences and Disorders (CSD) student with a current cumulative GPA of 2.887. Based on the CSD requirements, this student is currently unable to be accepted into the program because they are lacking the required 3.0 cumulative GPA (Department of Communication Sciences and Disorders, 2014). The average .113 cumulative GPA increase associated with this study would allow them to be accepted to the program after one academic semester (based on GPA).

Most programs within the College of Education and Human service Professions require students to have a 2.5 cumulative GPA or better to enter a program (CEHSP Advising, 2014). Consider a freshman student who is currently receiving a 2.8 semester GPA for their first semester. After completing the program, based on the average increase, they would be increasing their semester GPA to 3.0354 for their following semester. Consider as well that after one semester, a student with a cumulative GPA of 2.36 would be eligible to be accepted into select programs based on GPA when factoring in the average .1498 cumulative GPA increase.

As previously stated, the average GPA increase for individuals starting the program with a GPA below a 2.5 was.1506 a semester and.1358 cumulatively. Based on these increases,

consider a pre-exercise science student looking to be accepted into the program. In order to be accepted the student must have a cumulative GPA of 2.5 (University Catalogs, 2014). In this scenario, a student with a 2.37 cumulative GPA would be eligible to be accepted (based on GPA) one semester after completing the program.

Of all of the participants in the program, 73% of the students had a 3.0 or better cumulative GPA as of January 2012 with 63% of the students have a GPA of 3.4 or higher. Being that a 3.0 is a B average, we found that students were maintaining their GPA rather than exceeding it. This accounts for the lower grade point increase.

Those students who participated in the program while on probation showed the largest increase in both their semester and cumulative GPA. For students below a 2.0 and on the verge of being dismissed, they are required to show growth and improvement within their academics to remain in the college (Academic Affairs, 2014). Therefore, take a student with a 2.8 cumulative GPA. After one semester, with the average GPA increase of .2263, the student would be eligible to be taken off of probation.

Student Testimony

As stated, 46% of the subjects stated that they “really benefited from the program”, 43% stated that the “workshop helped somewhat’ and 7 % of the students were not sure if they had benefited yet. The final 4% listed that they did not benefit. However, this response seemed to be skewed. The subject answered that they found weekly meetings valuable and would recommend the course. In addition, they benefitted from the Reorganization strategies that they were given. Furthermore, students felt more engaged in their academics and found that their confidence in the ability to succeed academically had increased as well.

Retention

Of the students participating in the program, only three were dismissed from UMD due to academics. As you can see from the table, there were a total 8 individuals who were no longer a student. As students implemented their specific learning style strategies, academic success increased. In addition to the increased GPA, students felt more engaged in their academics and felt confident in their ability to succeed, thus retention increased. Using the learning style tools increased student academic self-efficacy which, as stated, is the highest contributing factor to GPA and retention (Zajacova, Lynch & Espenshade, 2005).

Summary

A small pilot study yielded results indicating those students who participated in a program focused on learning styles and student implementation increased both their semester and cumulative GPA's. Therefore, the results support the theory that implementation of a learning styles education in a higher education setting will increase student academic success. These results illustrate the importance of student lead implementation in academics as documented in Samms and Friedels (2012) research. Based on these findings, and the lack of similar research, it is clear additional research needs to be done on the importance of a student initiated learning styles intervention.

Chapter 5

Summary and Conclusions

"Learning styles refer to individuals' modes of making meaning of and dealing with knowledge and not merely reacting to external forces" (Colucciello, 1999, p 295). The making of meaning promotes deeper learning, higher self-efficacy and thus, academic success. Incorporating learning styles into a higher education setting provided students the ability to make deeper connections to the material, and based on our results, increase their academic success. The *You are Smarter than You Think* program began as a student success workshop. With its development, it became clear that the results of participation were substantial and the theory behind the program was valid.

Educational Implications

Growing research is being performed on the validity of learning styles in increasing student academic success. However, the focus has been on the k-12 classroom and/or style matching (Glenn, 2009). According to Wilbert McKeachie (1995), the past president of the American Psychological Association and the American Association of Higher Education, most attempts made by teachers to *match* students learning styles have proved to have little effect upon learning .Instead of focusing on teaching to the learning style, we need to focus on teaching students the skills and strategies they can use to become more effective students regardless of the instruction style.

Based on the findings from this program, it is clear that implementation is effective. There is a strong lack of research based on learning styles in higher education, and students are suffering as a result of this. According to recent GPA Trends nationwide, the average GPA of a college student (accounting for both public and private school) is 3.11 as of 2007. In 1997, the

average GPA for an individual attending the College of Liberal Arts program at the University of Minnesota was a 2.95 (www.gradeinflation.com, n.d.). Based on the results of this project, students with a GPA above a 2.5 (with a majority above a 3.0 much like the GPA average) would continue to increase their cumulative GPA after implementing learning styles strategies with average semester increases of .07. For a student with a desire to attend graduate school, these increases can mean the difference between acceptance or not.

In the fall of 2013, 596 students received a grade below a C+ in 1000 level courses in the College of Education and Human Service Professions at UMD (umreports, n.d.). While it cannot be assumed that all of the 596 students would have benefitted from participation in a learning styles program, it can be stated that those who struggled academically and thus, received a grade below the average GPA, may have benefitted from such a program. When considering research already completed on learning styles and the effect implementation has on student success and GPA, The results of this study suggests that based on the current GPA of students, it is evident incorporation is critical.

Recommendations for Future Research

McKeachie (1995) stated, “Regardless of their learning styles, students can learn strategies that enable them to be effective when taught by methods that are not compatible with their preferred style” (p 2). And yet, the majority of research and practice of learning styles continues to focus on matching of learning styles (Wilson, 2011). As the research progressed, a need for additional work with professors was needed. Having the opinion of faculty plays an important role in solidifying the fact that matching to students is not plausible in a higher education setting. In addition, this research lacked detailed class results. Had the opportunity been available, collecting data from specific classes and courses throughout the university would

have been beneficial as well. This data could show the progression of student growth throughout the period of a semester in various coursework. In addition, it is my belief that with the implementation of learning styles, a positive trend would occur with test results.

Due to resources, the sample size was small. I found with most of the research related to learning styles, the sample size is relatively minimal. I can only assume this is due to the complexity of data collection and methodology. These small sample sizes make it difficult to prove that the implementation of a learning styles strategy is the main reason for success.

Lastly, I would like to consider the possibility of creating a project that focuses on the difference between matching styles with faculty and the current method of implementation. Based on growing research and testimonies, it is my belief the style adopted by my research would be more effective, and thus, would have higher implications for future students. My future research would focus on supporting Wilbert McKeachie's statement, "What we teachers need to do is to help students develop the skills and strategies needed for learning effectively from teachers who do not match the students' preferred learning style" (McKeachie, 1995, pg. 2).

Summary

Based on the findings from this research as well as the research of others, such as Freidel and Samms (2012) as well as Mayfield (2012), it is clear implementation of learning styles does elicit positive effects on academic success. However, in the opinion of this researcher, they are not being utilized nearly enough or in the correct manner in the Higher Education system. Students, professors and Universities as a whole would benefit from continued research surrounding implementation of learning styles in a higher education setting and the effect on student academic success.

Appendix

Carolyn Aebi <caebi@umn.edu>

IRB Determination

Jeffery Perkey <perke001@umn.edu> Tue, Dec 10, 2013 at 11:24 AM
To: Carolyn Aebi <caebi@umn.edu>

Hello Carolyn,

Thank you for submitting the IRB Detemination Form.

Since the data you are using was originally collected under an IRB exemption and has since been de-identified, UMN IRB review is not needed for the analysis of the data.

The stamped form indicating that decision is attached for your records.

Jeffery

--
Jeffery Perkey, MLS, CIP
Research Compliance Supervisor, Social Behavioral Sciences IRB
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direct line 612-626-5922
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20131209AebiDetermination.pdf
188K

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Academic Probation Information: http://www.d.umn.edu/vcaa/AcademicStanding.html

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